

x600 Series

Layer 3 Gigabit

Ethernet Switches

x600-24Ts
x600-24Ts/XP
x600-48Ts
x600-48Ts/XP



Installation Guide

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Electrical Safety and Emissions Standards

This product meets the following standards.

U.S. Federal Communications Commission

Radiated Energy

Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: Modifications or changes not expressly approved of by the manufacturer or the FCC, can void your right to operate this equipment.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

RFI Emissions FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI
Class A, C-TICK, CE

Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

EMC (Immunity) EN55024

Electrical Safety EN60950-1 (TUV), EN60825-1 (TUV), UL 60950-1 (_CUL_{US}), CSA-C22-2
No. 60950-1 (_CUL_{US})



Laser Safety EN60825

Translated Safety Statements

Important: The  indicates that a translation of the safety statement is available in a document entitled *Translated Safety Statements for the x600 Series Layer 3 Gigabit Ethernet Switches* (613-000990).

Contents

Preface	7
Product Documentation	8
Starting a Management Session	9
Safety Symbols Used in this Document	10
Where to Find Web-based Guides	11
Contacting Allied Telesis	12
Online Support	12
Email and Telephone Support.....	12
Warranty.....	12
Returning Products	12
Sales or Corporate Information	12
Management Software Updates.....	12
Chapter 1: Overview	13
Introduction.....	14
Switch Descriptions	15
x600-24Ts Switch.....	15
x600-24Ts/XP Switch.....	16
x600-48Ts Switch.....	17
x600-48Ts/XP Switch.....	18
10/100/1000Base-T Twisted Pair Ports	19
Connector Type.....	19
Speed.....	19
Duplex Mode.....	19
Maximum Distance.....	19
Cable Type	20
Auto-MDI/MDI-X.....	20
Port Pinouts.....	20
SFP Transceiver Slots.....	21
XFP Transceiver Slots.....	22
Redundant Twisted Pair Ports.....	23
SD Card Slot.....	24
Port LEDs	25
10/100/1000Base-T Twisted Pair Port LEDs	25
SFP LEDs	26
XFP Transceiver Slot LEDs	26
System LEDs.....	27
Stack LEDs.....	28
Secure Digital LEDs	29
Terminal Port	30
AT-RPS3204 Redundant Power Supply.....	31
AT-LBM Module.....	32
AC Power Connector.....	33
Chapter 2: Installing the Hardware	35
Reviewing Safety Precautions	36

Contents

Unpacking a Switch	38
Installing the Power Cord Retaining Clip	39
Installing the Switches in an Equipment Rack	40
Resetting the Switch	42
Chapter 3: Cabling the Network Ports	43
Twisted Pair and Fiber Optic Cable Specifications	44
Twisted Pair Cable Specifications	44
Optional Transceiver Cable Specifications	45
Installing Optional Transceivers	46
Installing an SFP Transceiver.....	46
Installing an XFP Transceiver.....	49
Cabling the Twisted Pair and Fiber Optic Ports	51
Powering on a Switch	52
Starting a Local Management Session.....	53
Warranty Registration	54
Chapter 4: Troubleshooting	55
Power LED is Off	56
Twisted Pair Port Link LED is Off.....	57
SFP or XFP LED is Off	58
Transceiver is Installed but the Status is “Not Present”	59
System Fault LED is Blinking	60
System Fault LED is Steadily On	61
Cannot Establish a Local (Out-of-Band) Management Session.....	62
Switch Functions Intermittently	63
Appendix A: Technical Specifications	65
Physical Specifications	65
Environmental Specifications	65
Power Specifications.....	66
Certifications	66
RJ-45 Twisted Pair Port Pinouts	67
RJ-45 Style Serial Terminal Port Pinouts.....	69
RPS 21-pin D-combo Port and Connector Pinouts	70

Preface

This guide contains the installation instructions for the x600 Series Layer 3 Gigabit Ethernet Switches. This preface contains the following sections:

- “Product Documentation” on page 8
- “Starting a Management Session” on page 9
- “Safety Symbols Used in this Document” on page 10
- “Where to Find Web-based Guides” on page 11
- “Contacting Allied Telesis” on page 12

Product Documentation

For overview information about the software features of the AlliedWare Plus™ Operating System Software which runs on the x600 Series Switches, refer to:

- *AlliedWare Plus™ Operating System Software Reference Guide*

Starting a Management Session

For instructions that describe how to start a local management session on an x600 switch, refer to the “Starting a Local Management Session” on page 53. For information that describes how to log onto the AlliedPlus™ Operating System Software, see the *AlliedWare Plus™ Operating System Software Reference Guide*.

Safety Symbols Used in this Document

This document uses the safety symbols defined in Table 1.

Table 1. Safety Symbols

Symbol	Meaning	Description
	Caution	Performing or omitting a specific action may result in equipment damage or loss of data.
	Warning	Performing or omitting a specific action may result in electrical shock.

Where to Find Web-based Guides

The installation and user guides for all Allied Telesis products are available in portable document format (PDF) on our web site at www.alliedtelesis.com. You can view the documents online or download them onto a local workstation or server.

Contacting Allied Telesis

This section provides Allied Telesis contact information for technical support as well as sales and corporate information.

Online Support

You can request technical support online by accessing the Allied Telesis Knowledge Base: www.alliedtelesis.com/support/kb.aspx. You can use the Knowledge Base to submit questions to our technical support staff and review answers to previously asked questions.

Email and Telephone Support

For Technical Support via email or telephone, refer to the Support section of the Allied Telesis web site: www.alliedtelesis.com.

Warranty

The x600 Series Layer 3 Gigabit Ethernet Switches are covered under a Lifetime Warranty (Two Years Fan & Power Supply). For warranty information, go to the Allied Telesis web site at www.alliedtelesis.com.

Returning Products

Products for return or repair must first be assigned a return materials authorization (RMA) number. A product sent to Allied Telesis without an RMA number will be returned to the sender at the sender's expense. For instructions on how to obtain an RMA number, go to the Support section on our web site at www.alliedtelesis.com.

Sales or Corporate Information

You can contact Allied Telesis for sales or corporate information through our web site at www.alliedtelesis.com.

Management Software Updates

New releases of the management software for our managed products are available from the following Internet sites:

- Allied Telesis web site: www.alliedtelesis.com
- Allied Telesis FTP server: <ftp://ftp.alliedtelesis.com>

If the FTP server prompts you to log on, enter "anonymous" as the user name and your email address as the password.

Chapter 1

Overview

This chapter contains the following sections:

- “Introduction” on page 14
- “Switch Descriptions” on page 15
- “10/100/1000Base-T Twisted Pair Ports” on page 19
- “SFP Transceiver Slots” on page 21
- “XFP Transceiver Slots” on page 22
- “Redundant Twisted Pair Ports” on page 23
- “SD Card Slot” on page 24
- “Port LEDs” on page 25
- “System LEDs” on page 27
- “Stack LEDs” on page 28
- “Terminal Port” on page 30
- “Secure Digital LEDs” on page 29
- “AT-RPS3204 Redundant Power Supply” on page 31
- “AT-LBM Module” on page 32
- “AC Power Connector” on page 33

Note

Do not begin the installation procedures in this guide until you have read the *AlliedWare Plus™ Operating System Software Release Notes* that are included with the latest release of the AlliedWare Plus™ Operating System Software.

Introduction

The x600 Series Switches are managed Gigabit Ethernet switches that acts as standalone units. There are four Basic Layer 3 switches in the series:

- x600-24Ts Switch
- x600-24Ts/XP Switch
- x600-48Ts Switch
- x600-48Ts/XP Switch

The x600-24Ts and the x600-24Ts/XP switches both have 24 10/100/1000Base-T ports. The x600-48Ts and the x600-48Ts/XP switches both have 44 10/100/1000 Base-T ports.

All four switches have four SFP transceiver slots, an Secure Digital (SD) card slot, a console port, and a redundant power supply connector. In addition, the x600-24Ts/XP and the x600-48Ts/XP switches have two XFP transceiver slots.

On the back of all the switches there is an AC power connector, an RPS connector, and an expansion slot. You can connect the RPS connector to the AT-RPS3204 Redundant Power Supply. The x600 switches are shipped with a blank expansion slot with the exception of the The x600-48Ts/XP switch which is shipped with an AT-LBM (Link Back Mode) Module installed in the expansion slot.

The AlliedWare Plus™ Operating System Software runs on all the x600 switches.

For more detailed information about the switches, including illustrations, see “Switch Descriptions” on page 15.

Switch Descriptions

The following sections describe the x600-24Ts, x600-24Ts/XP, x600-48Ts, x600-48Ts/XP Series Layer 3 Gigabit Ethernet Switches.

x600-24Ts Switch

The x600-24Ts switch has the following hardware features:

- 24 10/100/1000Base-T ports
- Four Gigabit Ethernet small form-factor pluggable (SFP) transceiver slots
- An RJ-45 style serial terminal port for local (out-of-band) management
- One SD slot supporting 512KB and 1GB SD cards
- Status LEDs for the ports, transceiver slots, and system
- Redundant power supply connector
- Expansion slot for the AT-StackXG Stacking Module

Figure 1 shows the front panel of the x600-24Ts switch. Figure 2 shows the back panel of the x600-24Ts switch.

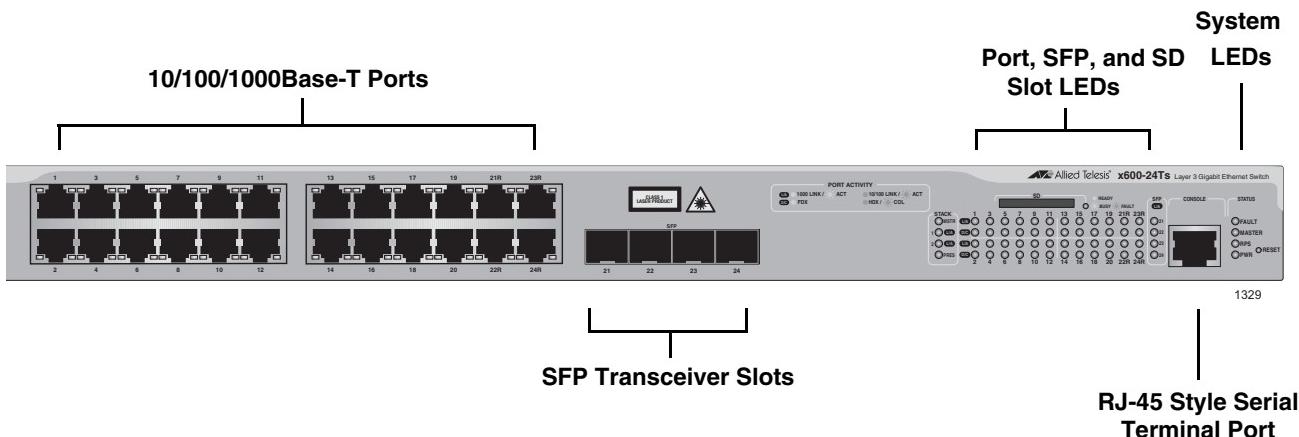


Figure 1. x600-24Ts Switch—Front Panel

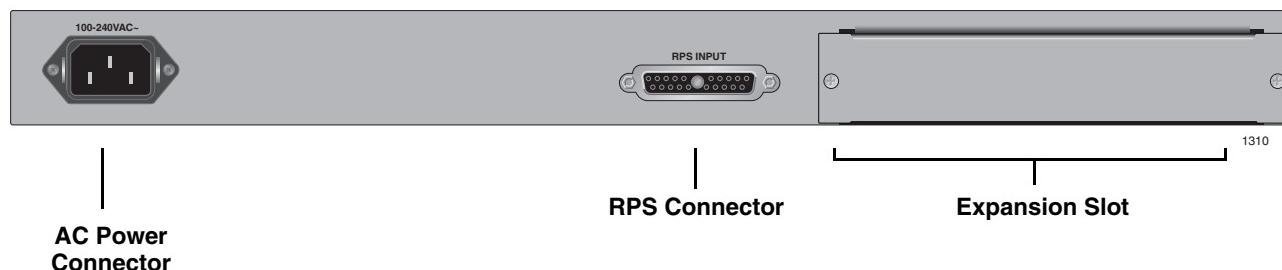


Figure 2. x600-24Ts Switch—Back Panel

- x600-24Ts/XP Switch** The x600-24Ts/XP switch has the following hardware features:
- 24 10/100/1000Base-T ports
 - Four Gigabit Ethernet small form-factor pluggable (SFP) transceiver slots
 - Two 10 Gigabit Ethernet small form factor pluggable (XFP) transceiver slots
 - An RJ-45 style serial terminal port for local (out-of-band) management
 - One SD slot supporting 512KB and 1GB SD cards
 - Status LEDs for the ports, transceiver slots, and system
 - Redundant power supply connector
 - Expansion slot for the AT-StackXG Stacking Module

Figure 3 shows the front panel of the x600-24Ts/XP switch. Figure 4 shows the back panel of the x600-24Ts/XP switch.

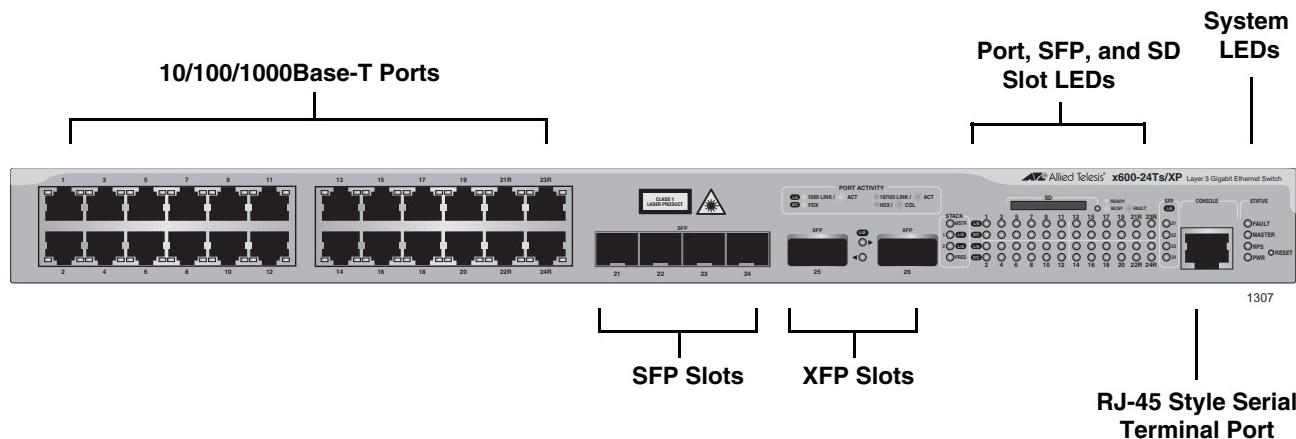


Figure 3. x600-24Ts/XP Switch—Front Panel

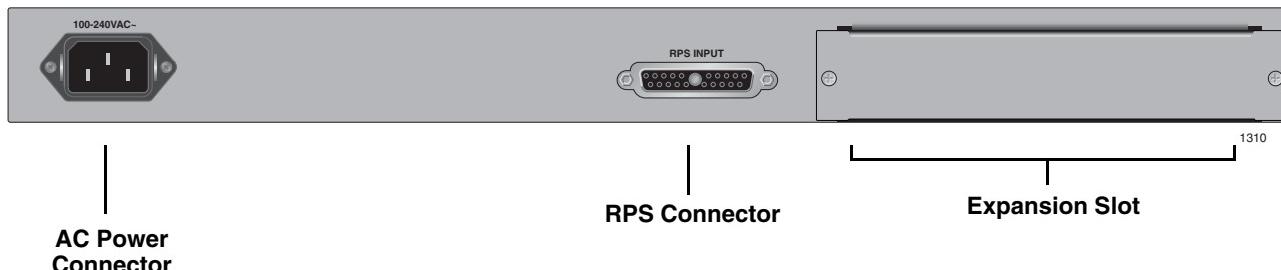


Figure 4. x600-24Ts/XP Switch—Back Panel

x600-48Ts Switch

The x600-48Ts switch has the following hardware features:

- 44 10/100/1000Base-T ports
- Four Gigabit Ethernet small form-factor pluggable (SFP) transceiver slots
- An RJ-45 style serial terminal port for local (out-of-band) management
- One SD slot supporting 512KB and 1GB SD cards
- Status LEDs for the ports, transceiver slots, and system
- Redundant power supply connector
- Expansion slot for the AT-StackXG Stacking Module

Figure 5 shows the front panel of the x600-48Ts switch. Figure 6 shows the back panel of the x600-48Ts switch.

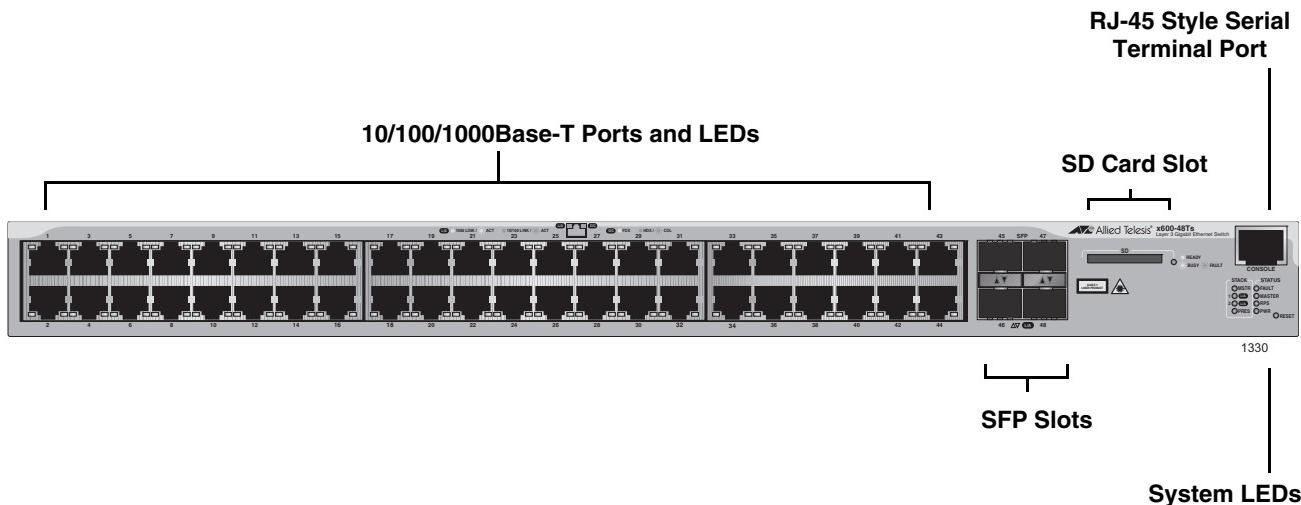


Figure 5. x600-48Ts —Front Panel

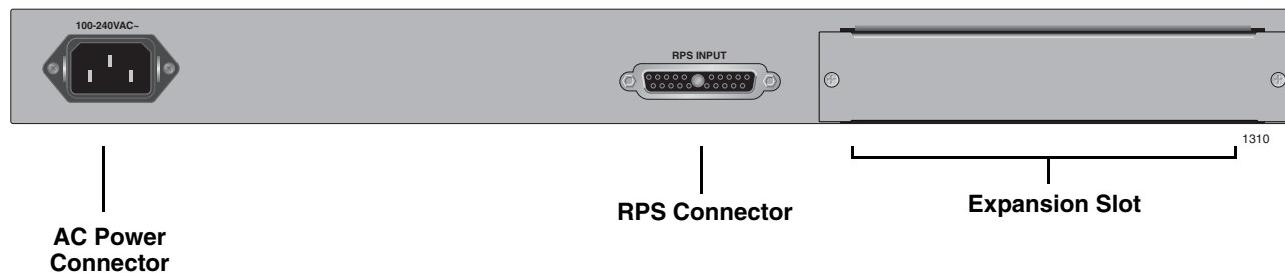


Figure 6. x600-48Ts —Back Panel

- x600-48Ts/XP Switch** The x600-48Ts/XP switch has the following hardware features:
- 44 10/100/1000Base-T ports
 - Four Gigabit Ethernet small form-factor pluggable (SFP) transceiver slots
 - Two 10 Gigabit Ethernet small form factor pluggable (XFP) transceiver slots
 - An RJ-45 style serial terminal port for local (out-of-band) management
 - One SD slot supporting 512KB and 1GB SD cards
 - Status LEDs for the ports, transceiver slots, and system
 - Redundant power supply connector
 - AT-LBM module installed in the back of the switch

Figure 7 shows the front panels of the x600-48Ts/XP switch. Figure 8 shows the back panel of the x600-48Ts/XP switch.

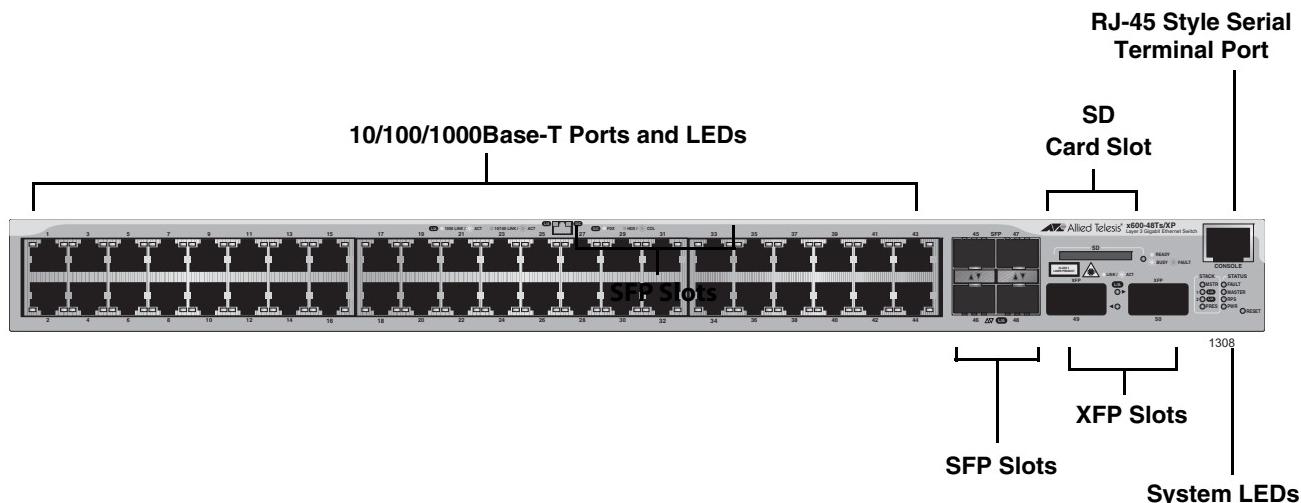


Figure 7. x600-48Ts/XP Switch —Front Panel

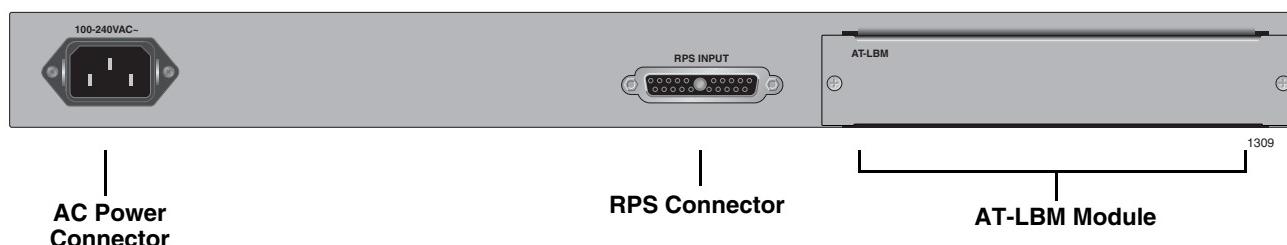


Figure 8. x600-48Ts/XP Switch —Back Panel

10/100/1000Base-T Twisted Pair Ports

This section describes the twisted pair ports on the switches.

Connector Type The ports are 8-pin RJ-45 connectors that use four pins at 10 or 100 Mbps and all eight pins at 1000 Mbps. For the pin assignments, refer to “RJ-45 Twisted Pair Port Pinouts” on page 67.

Speed A port’s speed can be 10, 100, or 1000 Mbps. The speed can be set automatically through Auto-Negotiation, the default setting, or manually with the AlliedWare Plus™ Operating System Software.

Note

To operate at 1000 Mbps, a twisted pair port must be set to Auto - Negotiation. The speed of a twisted pair port cannot be set manually to 1000 Mbps.

Duplex Mode A twisted pair port can operate in either half- or full-duplex mode. (Full-duplex mode is the only mode available when a port is operating at 1000 Mbps.) The twisted pair ports are IEEE 802.3u-compliant and Auto-Negotiate the duplex mode setting.

You can disable Auto-Negotiation on one or all of the switch ports so that you can set the duplex mode manually through the AlliedWare Plus™ Operating System Software.

Note

In order for a switch port to successfully Auto-Negotiate its duplex mode with a 10 or 100 Mbps end node, the end node must be configured for Auto-Negotiation. Otherwise, a duplex mode mismatch can occur. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation. This results in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

To avoid this problem when connecting an end node with a fixed duplex mode of full-duplex to a switch port, use the AlliedWare Plus™ Operating System Software to disable Auto-Negotiation on the port and set the port speed and duplex mode manually.

Maximum Distance The ports have a maximum operating distance of 100 meters (328 feet).

- | | |
|-------------------|---|
| Cable Type | The cabling requirements for a 10/100/1000Base-T port are: <ul style="list-style-type: none">□ For 10 Mbps operation: Standard TIA/EIA 568-B-compliant Category 3 or better shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.□ For 100 Mbps operation: Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.□ For 1000 Mbps operation: Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz. |
|-------------------|---|

Auto-MDI/ MDI-X

The twisted pair ports on the switch are IEEE 802ab-compliant and feature auto-MDI/MDI-X. This feature, available when a port's speed and duplex mode are set through Auto-Negotiation, automatically configures a switch port to MDI or MDI-X depending on the wiring configuration of the port on the end node. This allows you to connect any network device to a port on the switch using a straight-through twisted pair cable.

If Auto-Negotiation is disabled on a port and the speed and duplex mode are set manually, the auto-MDI/MDI-X feature is also disabled and the port's wiring configuration defaults to the MDI-X setting. This setting can be configured with the AlliedWare Plus™ Operating System Software.

Port Pinouts

Refer to Table 10 on page 67 for the port pinouts when a twisted pair port operates at 10 or 100 Mbps in the MDI configuration and Table 11 on page 67 for the MDI-X configuration. For port pinouts when a twisted pair port operates at 1000 Mbps, refer to Table 12 on page 68.

SFP Transceiver Slots

All of the x600 Series switches feature slots for four optional Gigabit Ethernet SFP transceivers that interconnect network devices over large distances using fiber optic cable. Figure 9 illustrates an SFP transceiver.



Figure 9. SFP Transceiver

Note

For a list of supported SFP transceivers, contact your Allied Telesis sales representative.

XFP Transceiver Slots

The x600-24Ts/XP and the x600-48Ts/XP Switches have two slots for optional XFP 10 Gigabit Ethernet transceivers to connect high speed, 10 gigabit devices to the switch or create high speed backbone networks between switches.

Figure 10 shows an example of an XFP transceiver.

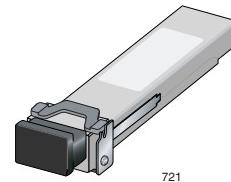


Figure 10. XFP Transceiver

Note

For a list of supported XFP transceivers, contact your Allied Telesis sales representative.

Redundant Twisted Pair Ports

Four of the twisted pair ports on the x600-24-Ts and x600-24-Ts/XP switches are paired with SFP slots. The twisted pair ports are identified with the letter “R” for “Redundant” as part of their number on the faceplate of the unit. The ports and slots are listed in Table 2.

Table 2. Twisted Pair Ports Matched with SFP Slots

Models	Ports and Slots
x600-24Ts and x600-24Ts/XP	21R with SFP slot 21 22R with SFP slot 22 23R with SFP slot 23 24R with SFP slot 24

Follow these guidelines when using these ports and slots:

- Only one port in a pair can be active at a time. It can be either the twisted pair port or the corresponding SFP module.
- The twisted pair port is the active port when its SFP slot is empty, or when an SFP module is installed but has not established a link to an end node.
- The twisted pair port automatically changes to the redundant status mode when an SFP module establishes a link with an end node.
- A twisted pair port automatically transitions back to the active status when the link is lost on the SFP module.
- In nearly all cases, a twisted pair port and an SFP module share the same configuration settings, including port settings, VLAN assignments, access control lists, and Spanning Tree Protocol settings.
- An exception to the shared settings is port speed. If you disable Auto-Negotiation on a twisted pair port and set the speed and duplex mode manually, the speed reverts to Auto-Negotiation when an SFP module establishes a link with an end node.

SD Card Slot

All of the x600 Series Switches have an SD card slot which is designed for an SD card which stores configuration files and AlliedWare Plus™ Operating System Software image files. See Figure 11.

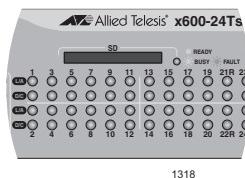


Figure 11. SD Card Slot

An SD card can make it easier for you to upgrade the files on a switch or transfer files between x600 switches. See Figure 12.



Figure 12. SD Card

Note

An SD card is not required for normal operations of the switch.

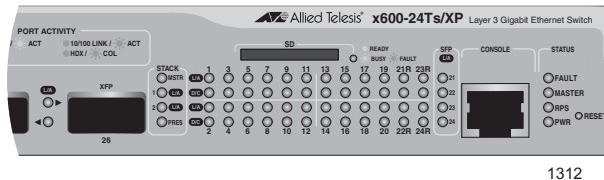
The x600 switches support the SD card that is available from many vendors.

To insert an SD card, position it so that the manufacturer's brand label is facing up and press it into the slot until it is flush with the front of the chassis. The SD card is self-ejecting. To remove the SD card, press the card toward the x600 switch and the SD card pops out.

For information on how to transfer files to and from a SD card, refer to the *AlliedWare Plus™ Operating System Software Reference Guide*.

Port LEDs

The following sections describe the twisted pair port, SFP, and XFP LEDs. See Figure 13 for an illustration of the port LEDs on an x600-24Ts/XP.



1312

Figure 13. Port LEDs on an x600-24Ts/XP Switch

10/100/1000Base-T Twisted Pair Port LEDs

A twisted pair port has two LEDs labeled L/A (link/activity) and D/C (duplex mode/collisions). The L/A LED indicates the speed and activity on a port. The D/C LED indicates the duplex mode (full- or half-duplex) and the status of collisions on the port.

The twisted pair port LEDs appear on the right side of the x600-24Ts and x600-24Ts/XP faceplates. On the x600-48Ts and x600-48Ts/XP faceplates, the twisted pair port LEDs are interspersed among the twisted pair ports.

Table 3 describes the LEDs for the 10/100/1000Base-T twisted pair ports.

Table 3. Twisted Pair Port LEDs

LED	Function	State	Description
L/A	Link Status and Activity	Off	No link has been established between the port and the end node.
		Green	The port has established a link at 1000 Mbps.
		Flashing green	Packets are being received or transmitted at 1000 Mbps.
		Amber	The port has established a link at 10 or 100 Mbps.
		Flashing amber	Packets are being received or transmitted at 10 or 100 Mbps.

Table 3. Twisted Pair Port LEDs (Continued)

LED	Function	State	Description
D/C	Duplex Mode and Collisions	Green	The port is operating in full-duplex mode.
		Amber	The port is operating in half-duplex mode (only applies when operating at 10 or 100 Mbps).
		Flashing amber	Collisions are occurring on the port (only applies when operating at 10 or 100 Mbps, half duplex mode).

SFP LEDs

Each SFP transceiver slot on the x600 switches has one LED, defined in Table 4.

Table 4. SFP Slot LED

LED	Function	State	Description
L/A	Link Status and Activity	Off	No link has been established between the port and the end node.
		Green	The port has established a link at 10 Gbps.
		Flashing green	Packets are being received or transmitted at 10 Gbps.

XFP Transceiver Slot LEDs

Each 10 Gigabit Ethernet transceiver slot on the x600-24Ts/XP and x600-48Ts/XP switches has one LED, defined in Table 5.

Table 5. XFP Slot LED

LED	Function	State	Description
L/A	Link Status and Activity	Off	No link has been established between the port and the end node.
		Green	The port has established a link at 10 Gbps.
		Flashing green	Packets are being received or transmitted at 10 Gbps.

System LEDs

The system LEDs on the front panel display general status information. See Figure 14.



1313

Figure 14. System LEDs

See Table 6 for a description of the system LEDs.

Table 6. System LEDs

LED	State	Description
FAULT	Off	Indicates normal operation.
	Red	Indicates a fault. The switch or the operating system software has malfunctioned. (Refer to Chapter 4, “Troubleshooting” on page 55 for instructions on how to troubleshoot a problem.)
MASTER	Off	The switch is not a member of an enhanced stack or has an enhanced stacking status of slave or unavailable.
	Green	The switch has an enhanced stacking status of master.
RPS	Off	No optional redundant power supply is connected to the switch.
	Green	An optional redundant power supply is physically connected to the switch and may be powered on or off.
POWER	Off	The switch is not receiving power.
	Green	The switch is receiving power.

Stack LEDs

The STACK LEDs reflect the status of the two Stack ports on the AT-StackXG Stacking Module. These LEDs remain off if the module is not installed. See Table 7 for a description of the STACK LEDs.

Table 7. STACK LEDs

LED	State	Description
MSTR	Off	The switch is not part of a stack or is a member unit of the stack.
	Green	The switch is the master unit of the stack.
1 L/A	Off	Stack Port 1 has not established a link to a stacking port on another AT-StackXG Stacking Module.
	Green	Stack Port 1 has established a link to a stacking port on another AT-StackXG Stacking Module.
	Flashing Green	Stack Port 1 has established a link to a stacking port on another AT-StackXG Stacking Module and is sending or receiving packet traffic.
2 L/A	Off	Stack Port 2 has not established a link to a stacking port on another AT-StackXG Stacking Module.
	Green	Stack Port 2 has established a link to a stacking port on another AT-StackXG Stacking Module.
	Flashing Green	Stack Port 2 has established a link to a stacking port on another AT-StackXG Stacking Module and is sending or receiving packet traffic.
PRES	Off	The expansion slot for the AT-StackXG Stacking Module is empty.
	Green	The AT-StackXG Stacking Module is installed in the switch.

Secure Digital LEDs

Both the x600-24Ts/XP and x600-48Ts/XP switches have one Secure Digital (SD) LED, defined in Table 8.

Table 8. Secure Digital LED

LED	Function	State	Description
SD	Link Status and Activity	Flashing amber	Indicates a fault has been detected. The SD card is not valid or a read or write procedure was unsuccessful.
		Green	An SD card has been detected.
		Flashing green	An SD card is reading or writing data. Do not eject the SD card when it is in this state.

Terminal Port

The terminal port is used to establish a local (out-of-band) management session with the switch. You establish a local management session by connecting a terminal or a personal computer with a terminal emulation program to the port.

The terminal port has an RJ-45 style connector. An RJ-45 to RS-232 management cable is supplied with the switch.

The terminal port is set to the following specifications:

- Default baud rate: 9600 bps (Range is 9600 to 115200 bps)
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

Note

These settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulation program.

AT-RPS3204 Redundant Power Supply

The RPS connector on the back panel of the switch connects to the optional AT-RPS3204 Redundant Power Supply Module, shown in Figure 15. The unit can provide power to the switch in the event that the switch's internal power supply fails.

The AT-RPS3204 Redundant Power Supply Module features one preinstalled AT-PWR3202 Power Supply and three empty slots for additional power supplies. Each power supply can support one x600 switch. When fully populated with AT-PWR3202 Power Supplies, the AT-RPS3204 unit can support up to four x600 switches simultaneously.

The AT-RPS3204 Redundant Power Supply Module is hot swappable with the x600 switches. This means that it is safe to connect a powered on AT-RPS3204 module to an x600 switch (which is also powered on) using a 21-pin D-combo connector cable from the module into the RPS connector on the x600 switch.

For information about installing an AT-RPS3204 unit, consult the documentation shipped with the unit.

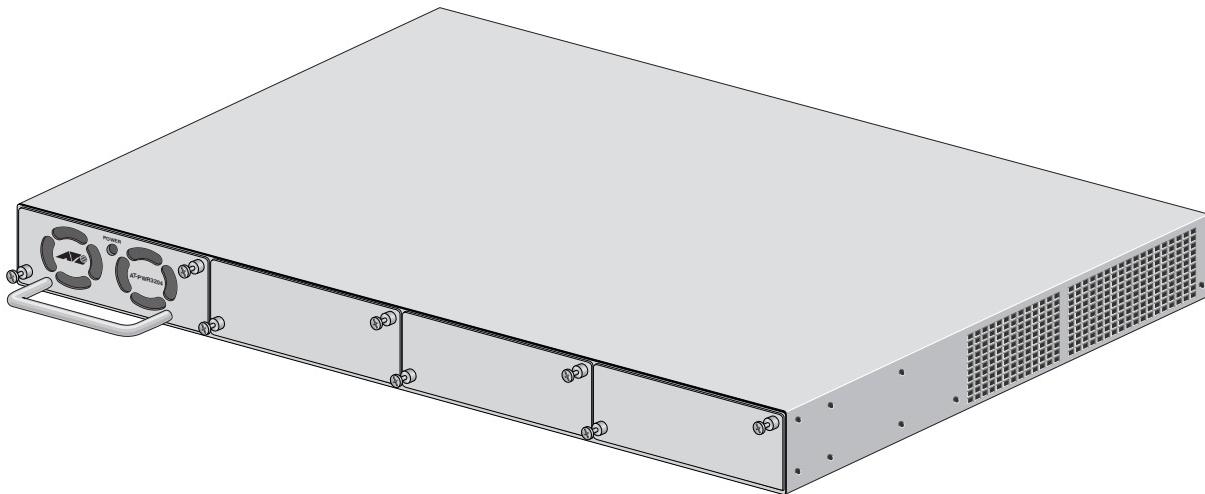


Figure 15. AT-RPS3204 Redundant Power Supply Unit

The pinouts for the redundant power supply's 21-pin D-combo port and connector are described in “RPS 21-pin D-combo Port and Connector Pinouts” on page 70.

AT-LBM Module

The AT-LBM (Link Back) Module is installed in the expansion slot of the x600-48Ts/XP switch. For an illustration, see Figure 8 on page 18. This module provides a nonblocking switching configuration when there are connections on the x600-48Ts/XP switch to all 44 copper ports and two XFP ports.

AC Power Connector

The x600 switches have a single AC power supply socket on the back panel, which has autoswitch AC inputs. To power the switch on or off, connect or disconnect the power cord.

Refer to “Technical Specifications” on page 65 for the input voltage range.

Chapter 2

Installing the Hardware

This chapter provides procedures to install an x600 switch. The chapter contains the following sections:

- “Reviewing Safety Precautions” on page 36
- “Unpacking a Switch” on page 38
- “Installing the Power Cord Retaining Clip” on page 39
- “Installing the Switches in an Equipment Rack” on page 40
- “Resetting the Switch” on page 42

Reviewing Safety Precautions

Please review the following safety precautions before you begin to install the switches or any of their components.

Note

The  indicates that a translation of the safety statement is available in a PDF document titled "Translated Safety Statements" (613-000990) posted on the Allied Telesis website at www.alliedtelesis.com.



Warning: Class 1 Laser product.  L1



Warning: Do not stare into the laser beam.  L2



Warning: To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables.  E1



Warning: Do not work on equipment or cables during periods of lightning activity.  E2



Warning: Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord.  E3



Warning: Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts.  E4

Pluggable Equipment. The socket outlet shall be installed near the equipment and shall be easily accessible.  E5



Caution: Air vents must not be blocked and must have free access to the room ambient air for cooling.  E6

Warning: Operating Temperature. This product is designed for a maximum ambient temperature of 40° degrees C.  E7

All Countries: Install product in accordance with local and National Electrical Codes. ↗ E8

Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. ↗ E21

Caution: Risk of explosion if battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Attention: Le remplacement de la batterie par une batterie de type incorrect peut provoquer un danger d'explosion. La remplacer uniquement par une batterie du même type ou de type équivalent recommandée par le constructeur. Les batteries doivent être éliminées conformément aux instructions du constructeur. ↗ E22



Warning: Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading. ↗ E25

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra). ↗ E35

Caution: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. ↗ E36



Warning: Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuits (e.g., use of power strips). ↗ E37

Unpacking a Switch

To unpack a switch, perform the following procedure:

1. Remove all components from the shipping packages.

Note

Store the packaging material in a safe location. You must use the original shipping material if you need to return the unit to Allied Telesis.

2. Place the switch on a level, secure surface.
3. Make sure the following components are included in your switch package. If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.
 - One x600 Series Layer 3 Gigabit Ethernet Switch
 - Two rack-mount brackets
 - Eight flathead Phillips rack-mount bracket screws
 - AC power cord (Americas, Australia, EU, Japan, and UK only)
 - AC power cord retaining clip
 - Management cable for local management

Installing the Power Cord Retaining Clip

Perform the following procedure to install the power cord retaining clip on the switches:

1. Locate the power cord retaining clip, shown in Figure 16.



Figure 16. Power Cord Retaining Clip

2. Install the clip on the AC power connector on the back panel of the switch. With the “u” of the clip facing down, press the sides of the clip toward the center and insert the short ends into the holes in the retaining bracket, as shown in Figure 17.

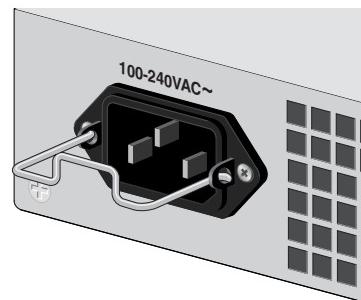
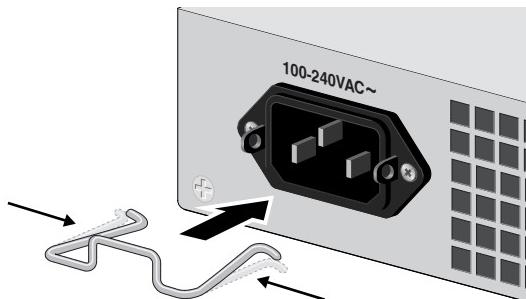


Figure 17. Inserting the Retaining Clip into the Retaining Bracket

You are now ready to install the switches in the equipment rack, as explained in the next procedure.

Installing the Switches in an Equipment Rack

Perform the following procedure to install each switch in a standard 19-inch rack:

Note

Steps 1, 2, and 3 are optional. These steps provide instructions on how to remove the snap-on plastic feet from the bottom of a switch. You can leave the feet on.

1. Place the switch upside down on a level, secure surface.
2. Using a flat-head screwdriver, remove the snap-on plastic feet from the bottom of the switch, as shown in Figure 18.

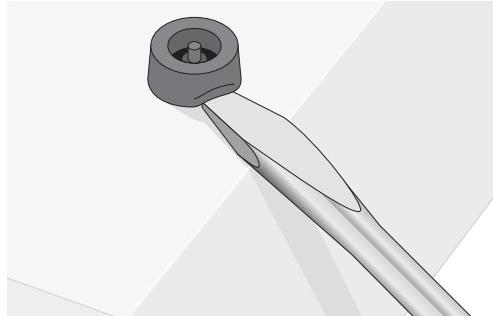


Figure 18. Removing the Feet

3. Turn the switch over.
4. Attach a rack-mount bracket to one side of the switch using four of the screws that come with the switch, as shown in Figure 19.

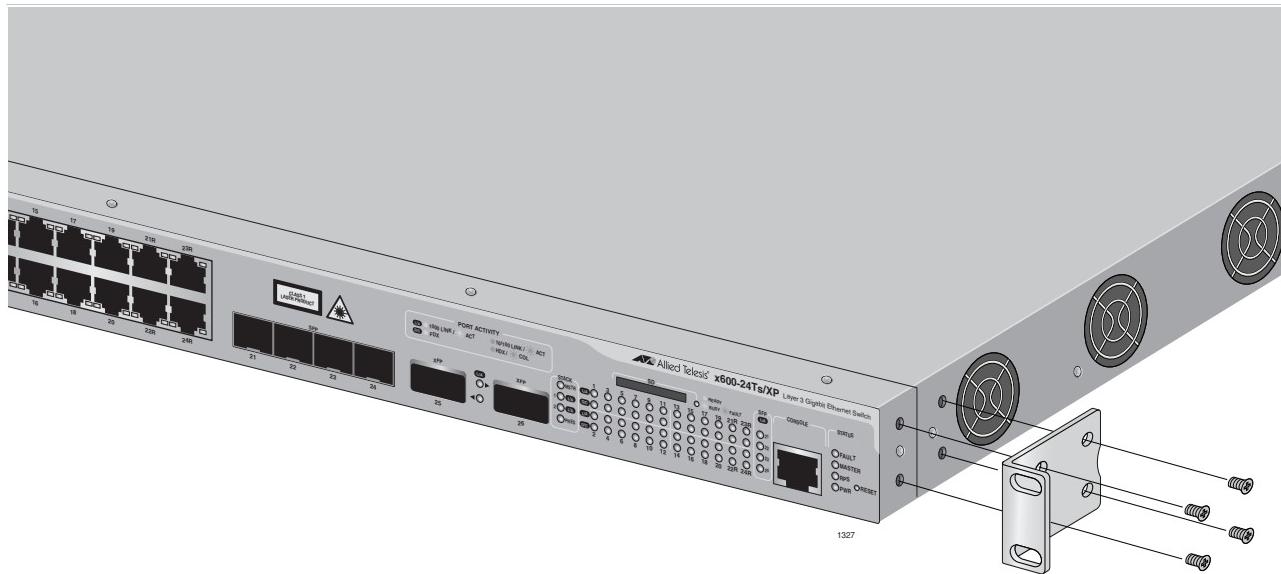


Figure 19. Attaching Rack-Mount Brackets

5. Install the second rack-mount bracket on the other side of the switch with the four remaining screws.
6. Mount the switch in a 19-inch rack using standard screws (not provided), as shown in Figure 20.



Figure 20. Mounting the Switch in a Rack

Resetting the Switch

You may need to reset the switch after upgrading the firmware or after you have made a configuration change that requires resetting the switch to activate the change.

To reset the x600 switch, perform the following procedure:

1. Locate the RESET button which is on the right hand side of the faceplate.
2. Press the RESET button with the tip of a pen or a similar nonconducting object as shown in Figure 21.

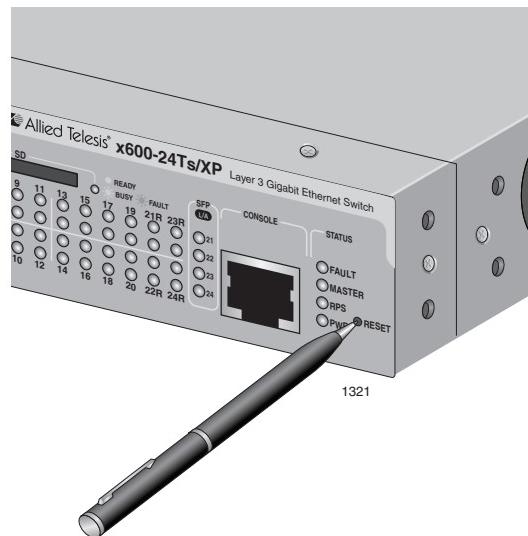


Figure 21. Resetting the Switch

Chapter 3

Cabling the Network Ports

This chapter contains the instructions for attaching network cables to an x600 switch. The chapter contains the following sections:

- “Twisted Pair and Fiber Optic Cable Specifications” on page 44
- “Installing Optional Transceivers” on page 46
- “Cabling the Twisted Pair and Fiber Optic Ports” on page 51
- “Powering on a Switch” on page 52
- “Warranty Registration” on page 54

Twisted Pair and Fiber Optic Cable Specifications

Twisted Pair Cable Specifications

Table 9 lists the cabling specifications for the 10/100/1000Base-T twisted pair ports.

Table 9. Twisted Pair Cabling and Distances

Speed	Cable Type	Maximum Operating Distance
10 Mbps	Standard TIA/EIA 568-B-compliant Category 3 or better shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.	100 m (328 ft)
100 Mbps	Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	100 m (328 ft)
1000 Mbps	Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	100 m (328 ft)

Note

The auto-MDI/MDI-X feature on the twisted pair ports automatically configures the MDI/MDI-X setting when a link is established with an end node. Available when a port is at the default setting of Auto-Negotiation, this feature allows you to use a straight-through twisted pair cable when connecting any type of network device to a port.

Disabling Auto-Negotiation on a port and setting the speed and duplex mode manually also disables the auto-MDI/MDI-X feature. A port where Auto-Negotiation has been disabled defaults to MDI-X. Disabling Auto-Negotiation may require manually configuring a port's MDI/MDI-X setting or using a crossover cable.

Note

A 10/100/1000Base-T twisted pair port must be set to Auto - Negotiation to operate at 1000 Mbps. You cannot manually set the speed of a twisted pair port to 1000 Mbps.

**Optional
Transceiver
Cable
Specifications**

The cable specifications for an optional SFP or XFP transceiver can be found in the transceiver's installation guide that is shipped with the device.

Installing Optional Transceivers

Review the following guidelines before installing an optional SFP or XFP transceiver in a switch:

- ❑ A transceiver can be hot-swapped; the switch can be powered on when you install it. However, you should always disconnect the cables first before removing a transceiver.
- ❑ You must install the transceiver before you connect the cables to it.
- ❑ Fiber optic transceivers are dust sensitive. When a fiber optic cable is not installed, or when you store the transceiver, always keep the plug in the optical bores. When you do remove the plug, keep it for future use.
- ❑ Unnecessary removal and insertion of a transceiver can lead to premature failure.



Warning

A transceiver can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device.

Installing an SFP Transceiver

To install an SFP transceiver in an x600 switch, perform the following procedure:

1. Remove the dust plug from a transceiver slot on the switch, as shown in Figure 22.

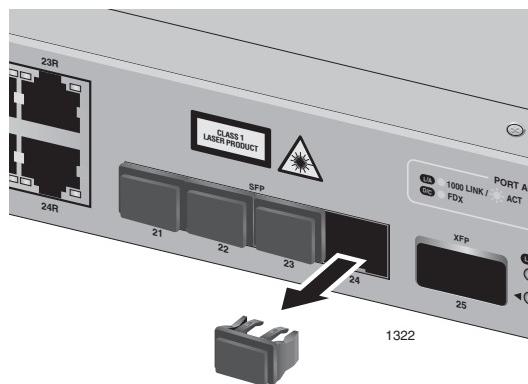


Figure 22. Removing a Dust Plug from an SFP Slot

2. Remove the transceiver from its shipping container and store the packaging material in a safe location.

3. Position the transceiver with the label facing up.
4. Slide the transceiver into the slot until it clicks into place.

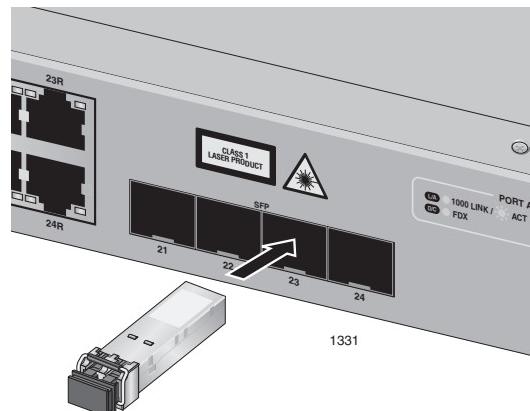


Figure 23. Installing an SFP Transceiver

5. For the x600-24Ts and x600-24Ts/XP switches, verify that the handle on the SFP transceiver is in the upright position, as shown in Figure 24, to prevent inadvertently removing the transceiver.

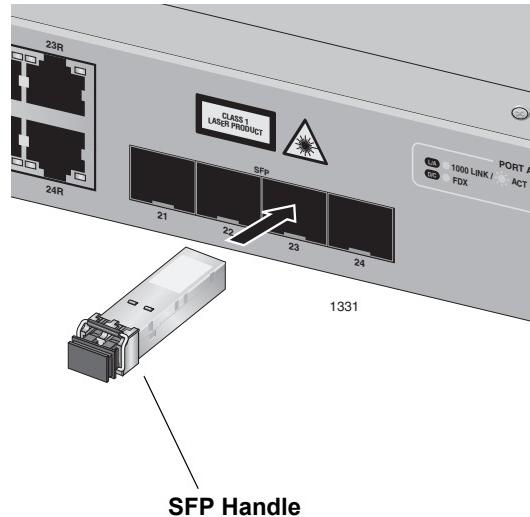


Figure 24. Positioning Handles on the x600-24Ts and x600-24Ts/XP Switches

6. For the x600-48Ts and x600-48Ts/XP switches, verify that handles on the top two SFPs are in the up position and the bottom two SFPs are in the down position as shown in Figure 25.

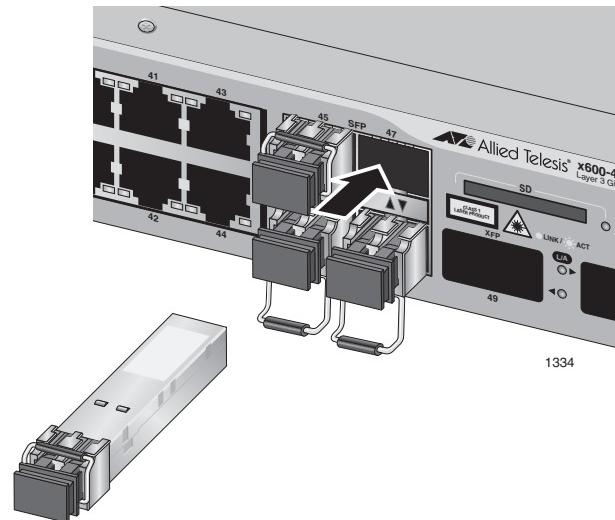


Figure 25. Positioning SFP Handles on the x600-48Ts and x600-48Ts/XP Switches

7. Repeat this procedure to install another SFP transceiver or go to “Cabling the Twisted Pair and Fiber Optic Ports” on page 51.

For SFP optical and cabling specifications, consult the documentation shipped with the module.

Installing an XFP Transceiver

To install an XFP transceiver in an x600 switch, perform the following procedure:

1. Remove the dust plug from a transceiver slot on the switch. Refer to Figure 26.

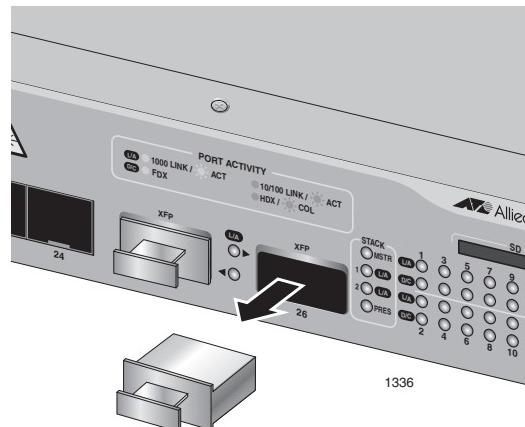


Figure 26. Removing an XFP Dust Plug

2. Remove the transceiver from its shipping container and store the packaging material in a safe location.
3. Position the transceiver with the label facing down.
4. Slide the transceiver into the slot until it clicks into place.

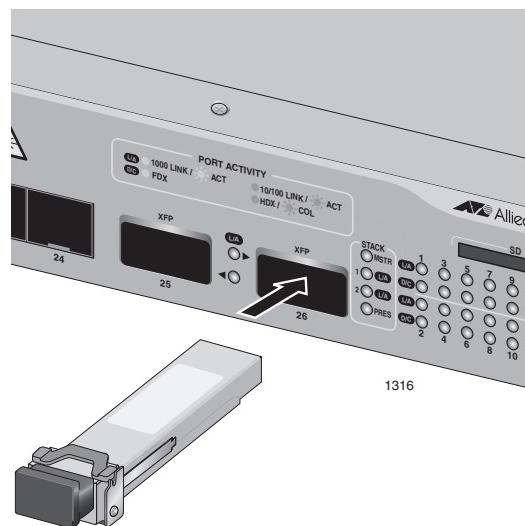


Figure 27. Installing an XFP Transceiver

5. Repeat this procedure to install a second XFP transceiver or go to “Cabling the Twisted Pair and Fiber Optic Ports” on page 51.

For XFP optical and cabling specifications, consult the documentation shipped with the module.

Cabling the Twisted Pair and Fiber Optic Ports

Observe the following guidelines when connecting a twisted pair or fiber optic cable to a port on the switch:

- ❑ The connector on the cable should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.
- ❑ Because the twisted pair ports on the switch are auto-MDI/MDI-X, any type of network device can be connected to a port on the switch using a straight-through twisted pair cable. If you disable Auto-Negotiation on the port, the port defaults to MDI-X.
- ❑ If your network topology contains a loop where two or more network devices can communicate with each other over more than one network path, do not connect the network cables forming the loop until you have activated a Spanning Tree Protocol on the switch. Data loops can adversely affect network performance.
- ❑ In order for a switch port to successfully Auto-Negotiate its duplex mode with an end node, the end node should also be using Auto-Negotiation. Otherwise, a duplex mode mismatch can occur. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation. This can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

To avoid this problem, disable Auto-Negotiation on a switch port and set the port's speed and duplex mode manually if the end node has a fixed duplex mode of full-duplex.

Powering on a Switch

To power on a switch, perform the following procedure:

1. Position the power cord retaining clip in the up position, as shown in Figure 28.

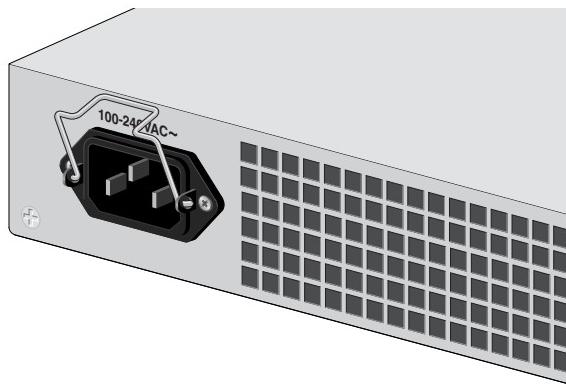


Figure 28. Power Cord Retaining Clip in the Up Position

2. Plug the power cord into the AC power connector on the back panel of the unit (see Figure 29).



Warning: Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. 

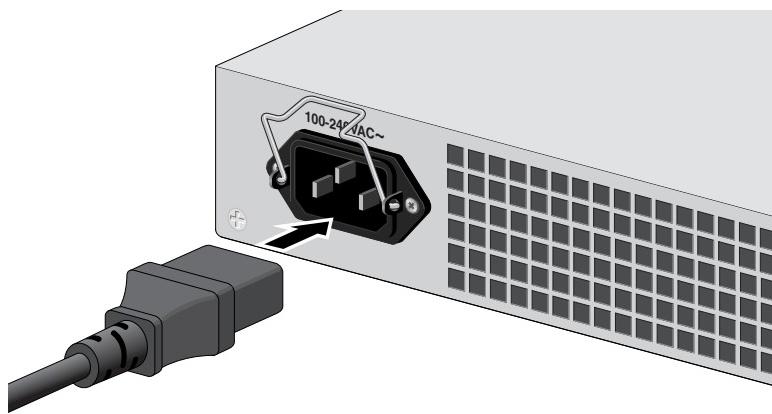


Figure 29. Connecting the AC Power Cord

3. Connect the other end of the power cord to an appropriate AC power outlet. For power specifications for the switch, refer to “Power Specifications” on page 66.

4. Start a local management session on the unit by performing the next procedure.

Starting a Local Management Session

The following procedure describes how to connect an RJ-45 cable to an x600 switch. For information about how to log onto the AlliedPlus™ Operating System Software, see the *AlliedWare Plus™ Operating System Software Reference Guide*.

To start a local management session on the unit, perform the following procedure:

1. Connect the RJ-45 end of the management cable included with the x600 switch to the Terminal Port on the front panel of the switch, as shown in Figure 30.

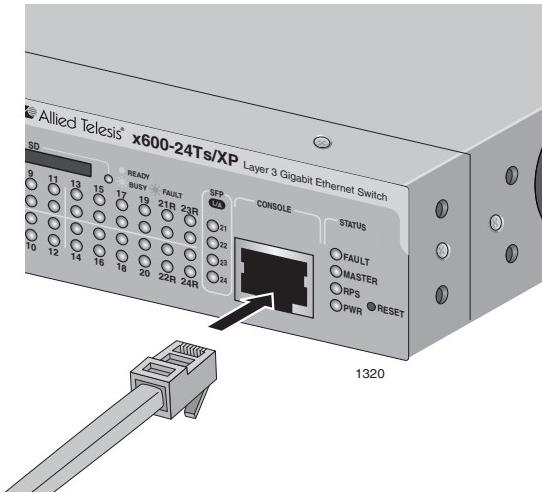


Figure 30. Connecting the Management Cable to the RJ-45 Terminal Port on the Switch

2. Connect the other end of the cable to an RS-232 port on a terminal or a personal computer with a terminal emulation program.
3. Configure the terminal or terminal emulation program as follows:
 - Baud rate: Default is 9600 bps (Range is 9600 to 115200 bps)
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None

Note

The port settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulator program.

Warranty Registration

For warranty information, go to the Allied Telesis web site at
www.alliedtelesis.com.

Chapter 4

Troubleshooting

This chapter contains information about how to troubleshoot a switch in the event a problem occurs. Sections in the chapter include:

- “Power LED is Off” on page 56
- “Twisted Pair Port Link LED is Off” on page 57
- “SFP or XFP LED is Off” on page 58
- “Transceiver is Installed but the Status is “Not Present”” on page 59
- “System Fault LED is Blinking” on page 60
- “System Fault LED is Steadily On” on page 61
- “Cannot Establish a Local (Out-of-Band) Management Session” on page 62
- “Switch Functions Intermittently” on page 63

Note

If you are unable to resolve the problem after following the instructions in this chapter, contact Allied Telesis Technical Support for assistance. Refer to “Contacting Allied Telesis” on page 12 for contact information.

Power LED is Off

Check the PWR LED on the front of the switch. If the LED is off, indicating that the unit is not receiving power, do the following:

- ❑ Make sure the power cord is securely connected to the power source and to the AC connector on the back panel of the switch.
- ❑ Verify that the power outlet has power by connecting another device to it.
- ❑ Connect the unit to another power source.
- ❑ Use a different power cord.
- ❑ Check that the voltage from the power source is within the required levels for your region.

Twisted Pair Port Link LED is Off

When a twisted pair port on the switch is connected to a properly operating end node, the Link LED for the port should be on. If a Link LED is off, do the following:

Note

A 1000Base-T connection can take from five to ten seconds to establish a link.

- Verify that the end node connected to the port is powered ON and is operating properly.
- Check that the twisted pair cable is securely connected to the port on the switch and to the port on the end node.
- Make sure that the twisted pair cable does not exceed 100m (328 ft).
- Verify that you are using the appropriate category of twisted pair cable. For information, refer to Table 9 on page 44.
- Determine if a crossover cable is required. Since the twisted pair ports feature auto MDI/MDI-X, you should be able to use a straight-through cable regardless of the type of device you connect to a port. However, if you disable Auto-Negotiation on a port and set a port's speed and duplex mode manually, the port defaults to MDI-X. Disabling Auto-Negotiation may require manually configuring a port's MDI/MDI-X setting or using a crossover cable.
- Make sure that the operating parameters of a port on the switch are compatible with the end node to which the port is connected. This may require using the switch's operating system software.
- For a switch port to successfully Auto-Negotiate its duplex mode with an end node, the end node should also be using Auto-Negotiation. Otherwise, a duplex mode mismatch can occur. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation. This can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

To avoid this problem, disable Auto-Negotiation on a switch port and set the port's speed and duplex mode manually if the end node has a fixed duplex mode of full-duplex.

- The switch has a bad cable detection feature that enables it to determine if a twisted pair cable has a electrical short that might cause a network loop. If the switch detects a bad cable on a port, it does not establish a link on that port. In this situation, replace the cable.

SFP or XFP LED is Off

When a fiber optic port on the switch is connected to a properly operating end node, the Link LED for the port should be on. If a Link LED is off, do the following:

- ❑ Verify that the end node connected to the port is powered ON and is operating properly.
- ❑ Check that the fiber optic cable is securely connected to the port on the switch and the port on the end node.
- ❑ If the fiber optic port is on a SFP or XFP transceiver, check that the transceiver is firmly inserted into the slot on the switch.
- ❑ Make sure that you are using the appropriate type of fiber optic cable and that the cable length does not exceed the allowed maximum distance. For cable specifications for an SFP transceiver, refer to the installation instructions shipped with the module.
- ❑ Use a fiber optic tester to test the attenuation on the cable and the strength of the optical signal. For operating specifications for an SFP transceiver, refer to the installation instructions shipped with the module.
- ❑ Check that the operating specifications (for instance, wavelength and maximum operating distance) of the fiber optic port on the remote end node are compatible with the fiber optic port on the switch.
- ❑ Check that the fiber optic ports on the switch and on the end node are operating at the same speed and duplex mode.
- ❑ A fiber optic cable contains two separate fiber strands. One strand is for receiving data and the other is for transmitting data. When you connect a fiber optic cable to a port, be sure that the receive fiber connector is connected to the transmit connector on the remote end node. In addition, check that the transmit fiber connector is connected to the receive connector on the remote node.

Note

The L/A LED for an SFP transceiver slot may remain ON if you remove the transceiver when it has a link to an end node without first disconnecting the fiber optic cable. The L/A LED will change to OFF the next time an SFP module is installed in the slot. To avoid this, always disconnect the fiber optic cable before removing a transceiver.

Transceiver is Installed but the Status is “Not Present”

If a SFP or XFP transceiver is installed in a transceiver slot but the Uplink Information menu in the AlliedWare Plus™ Operating System Software interface displays “Not Present” for that port, do the following:

- Verify that the transceiver is completely inserted in the slot on the front of the switch.

Note

The uplink status does not reflect whether a fiber optic cable is connected to the transceiver.

System Fault LED is Blinking

If the system FAULT LED is blinking, no action is required. A blinking FAULT LED could indicate that a new version of the operating system software is in the process of being downloaded to the switch or the switch is updating the active boot configuration file. The LED stops blinking after the switch has completed downloading the operating system software or updating the boot configuration file.

System Fault LED is Steadily On

If the system FAULT LED is steadily on, a problem has occurred in the switch. Do the following:

- Reset the switch by disconnecting and reconnecting the AC power cord.
- If the FAULT LED remains ON, download a new version of the switch's operating system software. For instructions, refer to the *AlliedWare Plus™ Operating System Software Reference Guide*.

Note

If the FAULT LED remains steadily on, contact Allied Telesis Technical Support for assistance. See "Contacting Allied Telesis" on page 12.

Cannot Establish a Local (Out-of-Band) Management Session

If you are unable to establish a local (out-of-band) management session with the switch through the terminal port on the front panel, do the following:

- ❑ Check that the RJ-45 serial management cable is securely connected to the serial terminal port on the switch and to the RS-232 port on the terminal or personal computer.
- ❑ Check that the operating parameters on the terminal or the terminal emulation program have been set correctly. The default settings for the RJ-45 serial terminal port can be found in “Starting a Local Management Session” on page 45.

Switch Functions Intermittently

If a switch functions intermittently, check the system hardware status through the management interface:

- Note the current voltage for the power supply compared to the optimum rating.
- Verify that the system temperature is within the operating range.

Appendix A

Technical Specifications

Physical Specifications

Dimensions (H x W x D):

x600-24Ts	4.40 cm x 44 cm x 30.5 cm (1.72 in. x 17.34 in. x 12.0 in.)
x600-24Ts/XP	4.40 cm x 44 cm x 30.5 cm (1.72 in. x 17.34 in. x 12.0 in.)
x600-48Ts	4.40 cm x 44 cm x 30.5 cm (1.72 in. x 17.34 in. x 12.0 in.)
x600-48Ts/XP	4.40 cm x 44 cm x 30.5 cm (1.72 in. x 17.34 in. x 12.0 in.)

Weight:

x600-24Ts	3.86 kg (8.50 lb.)
x600-24Ts/XP	4.35 kg (9.60 lb.)
x600-48Ts	4.88 kg (10.75 lb.)
x600-48Ts/XP	4.90 kg (10.80 lb.)

Recommended Minimum Ventilation on All Sides: 10 cm (4.0 in)

Environmental Specifications

Operating Temperature:	0° C to 40° C (32° F to 104° F)
Storage Temperature:	-25° C to 70° C (-13° F to 158° F)
Operating Humidity:	5% to 90% noncondensing
Storage Humidity:	5% to 95% noncondensing
Maximum Operating Altitude:	3,048 m (10,000 ft)
Maximum Nonoperating Altitude:	4,000 m (13,100 ft)

Power Specifications

Maximum Power Consumption:

x600-24Ts	76 watts
x600-24Ts/XP	76 watts
x600-48Ts	123 watts
x600-48Ts/XP	123 watts

Input Voltage:

AC	100-240V AC, 2.0 A maximum, 50/60 Hz
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Certifications

EMI (Emissions):	FCC Class A, ICES-003 Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, C-TICK, CE	
EMC (Immunity):	EN55024	
Electrical and Laser Safety:	EN60950-1 (TUV), EN60825-1 (TUV), UL 60950-1 (cUL _{US}), CSA-C22-2 No. 60950-1 (cUL _{US})	
Quality and Reliability (MTBF):	x600-24Ts	130,000 hrs.
	x600-24Ts/XP	130,000 hrs.
	x600-48Ts	90,000 hrs.
	x600-48Ts/XP	90,000 hrs.
Compliance Marks:	CE, cUL _{US} , TUV, C-Tick	

RJ-45 Twisted Pair Port Pinouts

Figure 31 illustrates the pin layout of an RJ-45 connector and port.

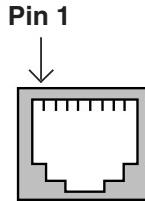


Figure 31. RJ-45 Connector and Port Pin Layout

Table 10 lists the pin signals when a port is operating in the MDI configuration at 10 or 100 Mbps.

Table 10. MDI Pin Signals - 10 or 100 Mbps

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

Table 11 lists the pin signals when a port is operating in the MDI-X configuration at 10 or 100 Mbps.

Table 11. MDI-X Pin Signals - 10 or 100 Mbps

Pin	Signal
1	RX+
2	RX-
3	TX+
6	TX-

The MDI/MDI-X setting is established automatically when a port is set to Auto-Negotiation. If a port's speed and duplex are set manually, the MDI/MDI-X setting defaults to the MDI-X setting.

Table 12 lists the pin signals when a port operating at 1000 Mbps.

Table 12. Pin Signals - 1000 Mbps

Pinout	Pair
1	Pair 1 +
2	Pair 1 -
3	Pair 2 +
4	Pair 3 +
5	Pair 3 -
6	Pair 2 -
7	Pair 4 +
8	Pair 4 -

RJ-45 Style Serial Terminal Port Pinouts

Table 13 lists the pin signals on the RJ-45 style serial terminal port.

Table 13. RJ-45 Style Serial Terminal Port Pin Signals

Pin	Signal
4	Data Carrier Detect
3	Transmit Data
6	Receive Data
7	Data Set Ready
5	Ground
2	Data Terminal Ready
8	Clear to Send
1	Request to Send

RPS 21-pin D-combo Port and Connector Pinouts

Figure 32 illustrates the pin layout of the RPS 21-pin D-combo port and connector.

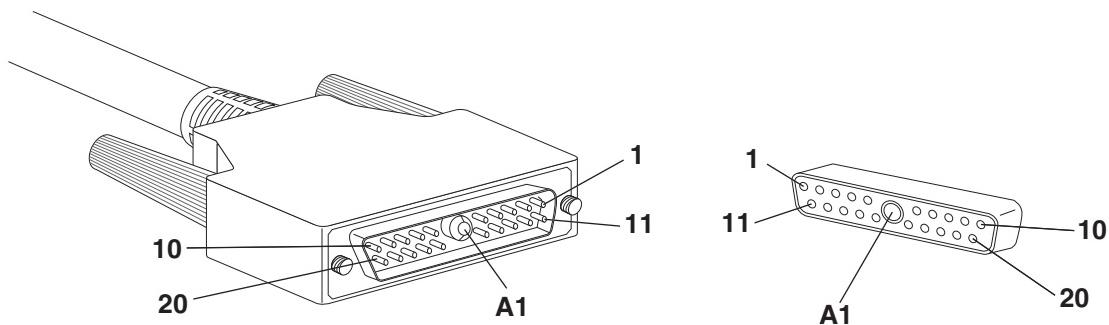


Figure 32. RPS 21-pin D-combo Connector and Port Pin Layout

Table 14 lists the definitions for the RPS 21-pin D-combo port and connector pins.

Table 14. RPS 21-pin Connector Pin Definitions

Pin	Definition
1	Power supply ID
2	Fan 2 status
3	Fan 1 status
4	RPS status
5	Ground
6	Ground
7	RPS status
8	+12.0 VDC sense
9	Primary 12V
10	No connect
11	Ground
12	Ground
13	Ground
14	Ground
15	Ground

Table 14. RPS 21-pin Connector Pin Definitions (Continued)

Pin	Definition
16	Ground
17	Ground
18	+12.0 VDC sense
19	Ground
20	No connect
A-1	+12.0 VDC

Appendix A: Technical Specifications